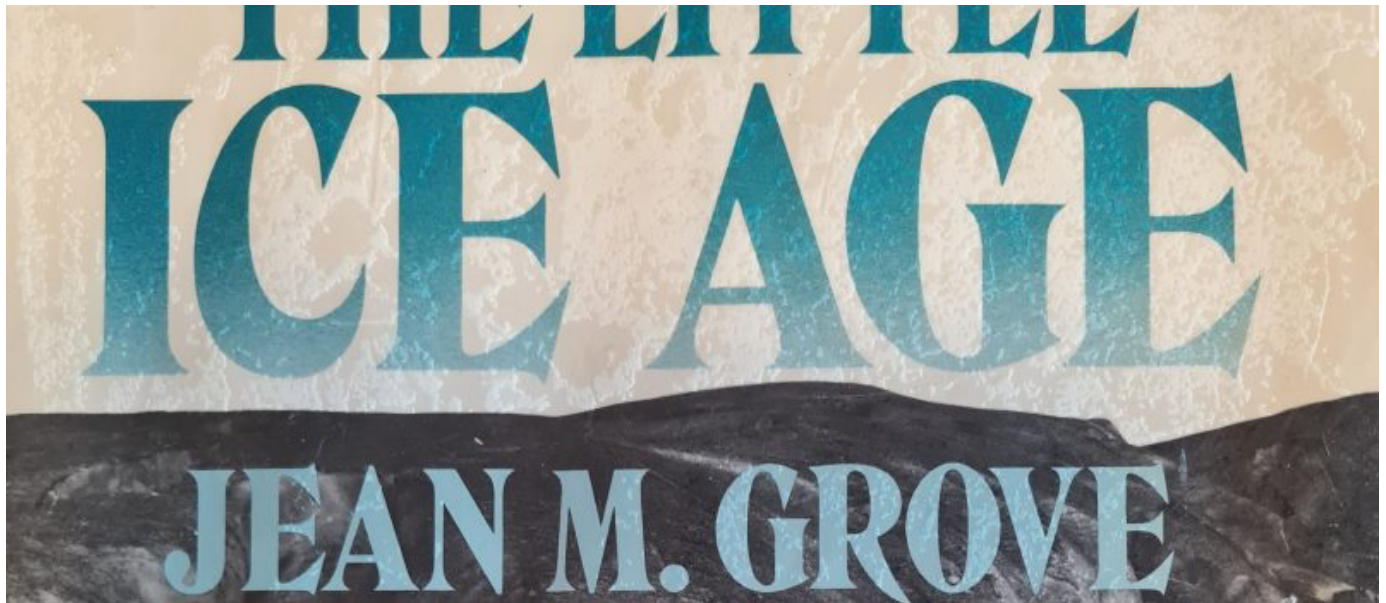


Mike Hulme

Professor Mike Hulme's Site

My 1988 'Climate Book of the Year'



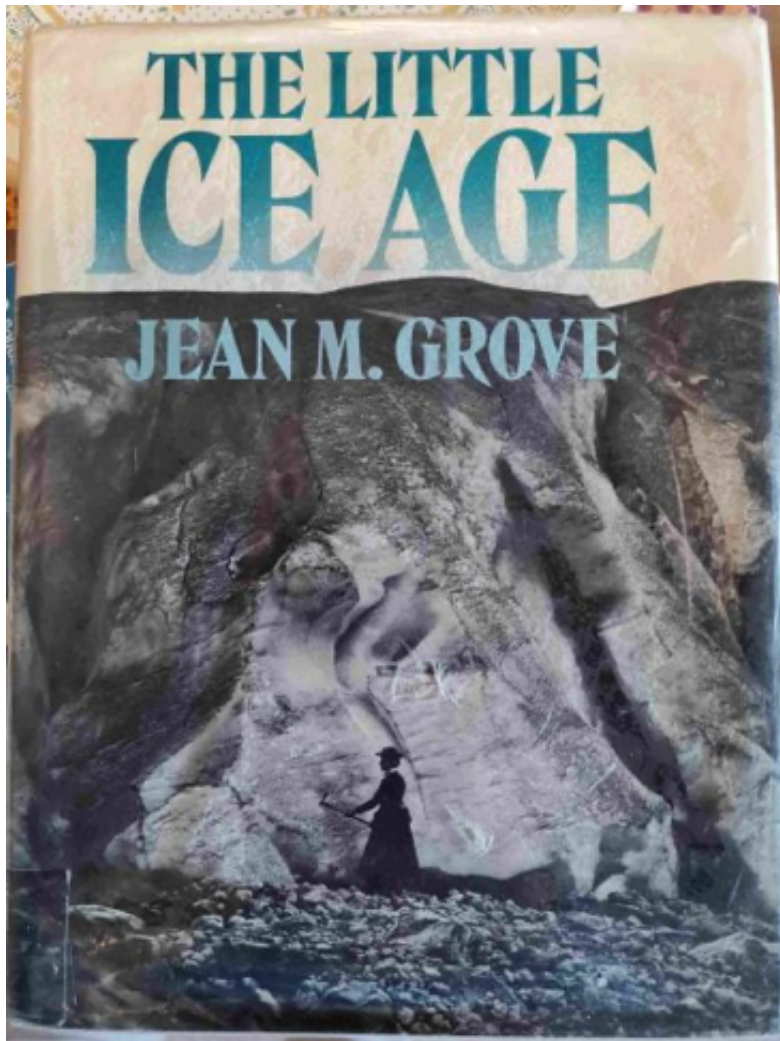
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Grove, J.M. (1988) *The Little Ice Age*. (1st Edn.) London: Methuen. 498pp.

This essay continues my series of monthly posts in which I select one 'climate' book to highlight and review from one of the 44 years of my professional career in climate research (starting with 1984, my first year of academic employment). The series will end in September 2027, the month in which I shall retire. [See here for more information](#) about the rationale for this series, and the criteria I have used in selecting my highlighted books.

This ['1988 essay' can be download as a pdf](#).

Many people in mid-to-high latitudes of the northern hemisphere will be familiar with the term 'Little Ice Age'. In Europe in particular, it conjures images of advancing



glaciers threatening Alpine villages or of Pieter Bruegel the Elder's 1565 painting 'The Hunters in the Snow' (shown below). My parents had a print of this painting hanging over our fireplace in the living room and I well remember being struck by the contrast between the icy scene and the warmth of the family hearth below. British culture, too, is saturated with stories and images of the River Thames frozen near the London bridges, and the six 'frost-fairs' held on the river in the 17th and 18th centuries. The imaginative resonance of the term Little Ice Age perhaps derives from the juxtaposition of the daunting spectre of an 'Ice Age' with the diminutive word 'Little' – an icy-climate offering the unsettling thrill of the sublime but in muted, and hence (just about) manageable, terms.

I have chosen for my **Climate Book of 1988** Jean Grove's treatise '**The Little Ice Age**'. Grove of course did not coin the phrase. For this we have to go back a further half century, to 1939, and an annual report of the Committee on Glaciers of the American Geophysical Union. Chaired at the time by the American geologist François Matthes, the Committee, after surveying evidence of the conditions of glaciers worldwide, concluded their six-page report thus,

...it is manifest from the relatively large-scale of [the glaciers'] oscillations during the last 100 years, [they] now have far greater extent and volume than they had during the middle third of the Post-Pleistocene interval [i.e., the period 8,000 to 4,000 years BP], and accordingly it may well be said that we are living in an epoch of renewed but moderate glaciation—a 'little ice age,' that already has lasted about 4000 years^[1].

The definition of the Little Ice Age therefore applied originally to a long period of time since the mid-Holocene, but over the subsequent 50 years it became

associated with the specific period of climatic history spanning the six centuries from around 1250 to 1850 CE.

It is in *this* context, then, that Jean Grove's book was so impressive, significant and influential.

A long-standing Fellow of Girton College Cambridge, and married to the dryland geomorphologist Alfred T

('Dick') Grove, Jean Mary Grove (née Clark) was 61 years old when 'The Little Ice Age' was published. Grove's interests in glaciers were developed during her time as an undergraduate geography student at Cambridge from 1945 to 1948, extending her existing passion for mountains inherited from her mountaineering parents^[2]. Her passion for fieldwork was fostered by the director of the Scott Polar Research Institute, Frank Debenham, and she first encountered glaciological fieldwork as a student member of a fieldwork team working in the Jotunheimen mountain range in Norway. Her PhD thesis, 'A study of the physiography of certain glaciers in Norway', was awarded in 1956 by the University of London, and it was during these years of teaching and PhD research at Bedford College, London, in the early 1950s that she was introduced to ideas of climate change and variability by the climate historian, Gordon Manley.



Grove's choice of photograph for the cover of 'The Little Ice Age' was carefully made. It is a striking image from 1899 of the American glaciologist and photographer Mary Vaux Walcott, ice axe in hand, at the crevassed front of the Illecillewaet Glacier in the Canadian Rockies. In Walcott, Jean Grove perhaps saw a representation of herself, a mountaineer and glacier explorer and someone committed to fieldwork and careful observation of glacial features. Grove frequently insisted that the students she taught at Girton College spend their summers engaged in geographical fieldwork^[3].

'The Little Ice Age' reviews the evidence, characteristics, causes and consequences of six centuries of climatic history from a glaciological perspective. It draws upon worldwide scientific and documentary data, although with a strong emphasis on Europe and the North Atlantic region owing to the abundance of evidence here. Grove places this account in the longer historical context of the Holocene and makes the argument that knowledge of past climatic variations is essential for fully realising the possibilities of future climatic change, whether regional or global. The book is magisterial in scope — and in price! (£85 in 1988 translates to about £300 today) — and in the meticulous way in

which evidence is gathered, marshalled and interpreted. Grove's astute perspective on how climatic variations matter for societies is summarised towards the end, "While climatic change cannot be ignored, it never acts alone. The impact must vary with the severity of the change, the character of the environment affected, and the social and economic, resilience of the people involved" (p.420). It is a perspective often lost sight of in today's obsession with climate neo-determinism and reductionism[4].

'The Little Ice Age' was widely reviewed at the time. John Matthews, for example, writing in *Progress in Physical Geography* refers to the "impressive coverage ... of historical evidence, dated moraine sequences, measurements of glacier size and mass balance, and glacier response to climate"[5]. In *Geoarchaeology*, Benedict and Maisch recommend "it should be required reading for historians and archaeologists inclined to underestimate the influence of climate upon past cultures ... nothing quite comparable is likely to be created in years to come"[6], while D E Smith for *Applied Geography* refers to Grove's "...judicious quotations [drawn] from the many contemporary sources [which] serve to bring the subject alive" and praises the book for its "authoritative scholarly account"[7]. These reviews all refer to one of Grove's central claims, namely that "the [glaciological] data coming from widely separated areas [of the world] seems to indicate a coherence which justifies a single name"[8]; for Grove, writing in the mid-1980s, "the Little Ice Age was a truly global event"[9].

It is certainly true that this is where the weight of scientific opinion lay at the time. Just two years later, in 1990, the Intergovernmental Panel on Climate Change (IPCC) published its First Assessment Report and in the section 'Paleo-Climatic Variations and Change' in its Working Group I Report, it succinctly summarised the situation. Referencing Grove's book specifically, and also including an illustration based on her work (its Figure 7.2), the IPCC said, "Of particular interest is the most recent cold event, the Little Ice Age, which resulted in extensive glacial advances in almost all alpine regions of the

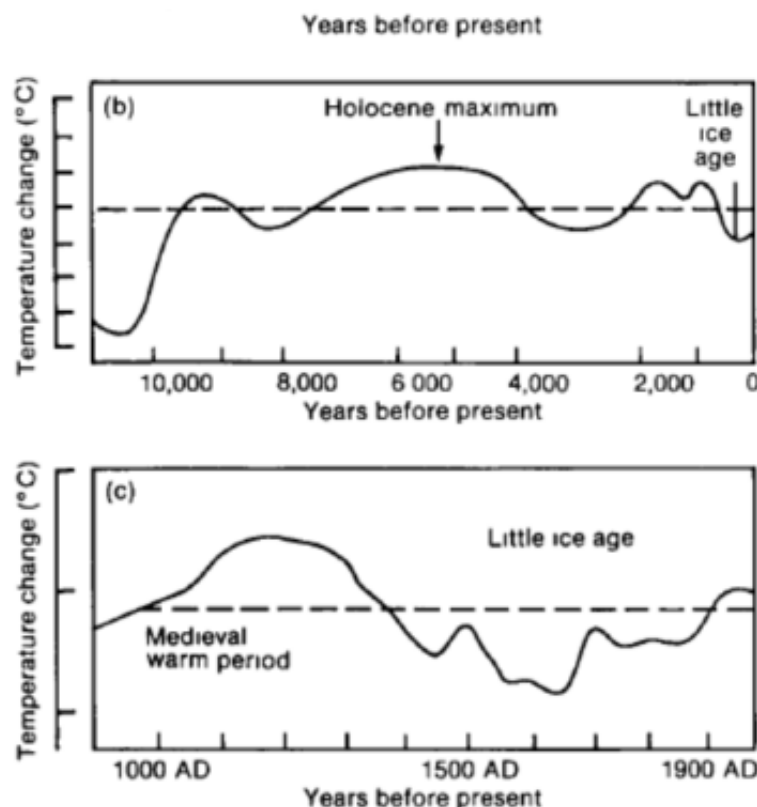


Figure 7.1: Schematic diagrams of global temperature variations since the Pleistocene on three time scales (a) the last million years (b) the last ten thousand years and (c) the last thousand years. The dotted line nominally represents conditions near the beginning of the twentieth century

world between 150 and 450 years ago (Grove, 1988)" [10].

For the IPCC, the Little Ice Age, although not continuously cold over 500 years, was "probably the coolest and most globally extensive [climatic] period since the Younger Dryas" (c.12,000 years ago). Visualising this claim, the IPCC famously included its Figure 7.1 (see left) which in schematic form reified the idea of the Little Ice Age [11].

Grove's pioneering book from 1988 became an essential reference for much of the subsequent work on the 'Little Ice Age', both scientific and historical. Over the last 30 years there have been book-length treatments of the historical significance of the

Little Ice Age for empires, politics, economies and cultures: thus, general history (Fagan, 2000), 17th century landscape painting (Sagar, 2006), European culture (Behringer et al., 2015), European settlers in North America (White, 2017), Dutch economic imperialism (Degroot, 2018), 'the West' in general (Blom, 2019), and China's Ming Dynasty (Brook, 2024) [12].

Yet this was not the whole story. Even as the IPCC reported in 1990, a growing number of paleoclimatologists were beginning to question the validity and utility of the generic term Little Ice Age. For example, at an international symposium held in Tokyo Metropolitan University in September 1991, Ray Bradley and Phil Jones presented a paper asking, 'When was the "Little Ice Age"?' Their reply, *contra* Grove, was that by no means was there sufficient evidence to declare this a synchronous global climatic episode and that the term should be used "cautiously", and always accompanied by an "explanation of what is meant by the term" [13]. Another international conference where these questions were debated was held a few years later in August 1997 at the University of Iceland in Reykjavik. The title was explicit: 'Was there a "Little Ice Age" in Northern Europe and the North Atlantic Region and, if so, where and when?'. Grove, now aged 70, presented a paper at this meeting — 'The initiation of the Little Ice Age in regions round the North

Atlantic' — and this appeared in print, posthumously in 2001[\[14\]](#), her last published research paper. Reviewing more recent evidence from around the North Atlantic region, Grove recognised that the Little Ice Age should not be thought of as a single, long, globally synchronous cold period, although she still defended her 1988 work on the grounds that “the term ‘Little Ice Age’ relates to the behaviour of the glaciers, not directly to [that of] climate” (p.76).

At the time of her death in January 2001, Jean Grove was completing work on a second edition of the book, incorporating much of the new research on the subject which has appeared since 1988. It appeared posthumously in 2004 as a two volume edition[\[15\]](#), compiled by her husband, Dick Grove. This was a 50 per cent expansion of the 1988 book and the publisher's advertising blurb reflected the position Grove had adopted in 2001, “Some authorities have thrown doubt on the existence of the Little Ice Age, but ‘Little Ice Ages: Ancient and Modern’ makes the case for a climatic sequence that can usefully be called the Little Ice Age and which had predecessors occurring at intervals of several centuries through much of the past 10,000 years”.

Yet the diminishing currency of the term ‘Little Ice Age’ was powerfully symbolised in the recent Sixth Assessment Report (AR6) of the IPCC. Thirty-one years after its First Report in 1990, and 33 years after Grove's book, in its 2,400 page Working Group I Report, the IPCC declared,

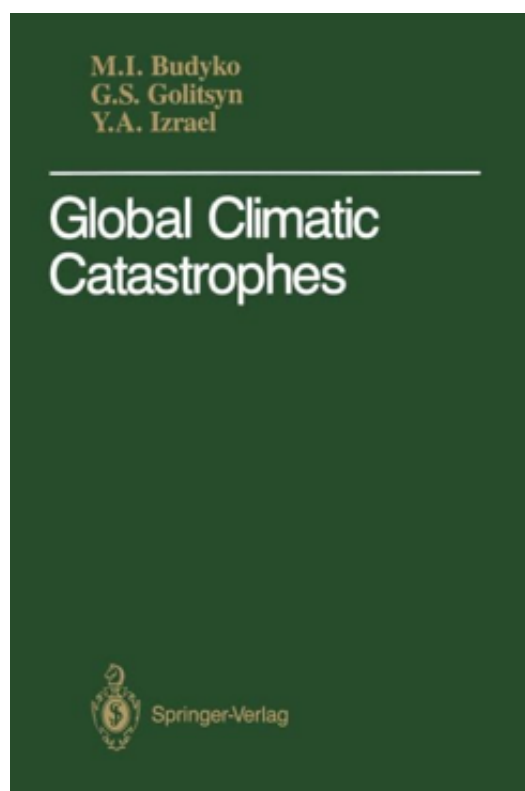
The terms ‘Little Ice Age’ and ‘Medieval Warm Period’ (or ‘Medieval Climate Anomaly’) are not used extensively in this report because the timing of these episodes is not well defined and varies regionally. Since AR5 [in 2013], new proxy records have improved climate reconstructions at decadal scale across the last millennium. Therefore, the dates of events within these two roughly defined periods are stated explicitly when possible.[\[16\]](#)

This revisionism in no way detracts from the pioneering work that Jean Grove committed her professional life to and which is beautifully represented in ‘The Little Ice Age’. When the book appeared in 1988, it was by far and away the most comprehensive account of historical and scientific knowledge of glacier fluctuations and their relationship to climate and society, in Europe especially, but also worldwide. In 2008, 20 years after publication, it was selected by the journal *Progress in Physical Geography* as one of its ‘classics in physical geography revisited’[\[17\]](#). And reviewing the book in 1989, Quaternary scientist Chalmers Clapperton fittingly concluded, “The text is a masterpiece of meticulous research on a huge topic ... Jean Grove is to be heartily congratulated in producing this marvellous culmination of her life-time's interest”.[\[18\]](#)

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Other significant climate books published in 1988

Budyko, M.I., Golitsyn, G.S. and Izrael, Yu.A. (1988) *Global Climatic Catastrophes*. Berlin: Springer-Verlag. [translated from the Russian by V.G. Yanuta]

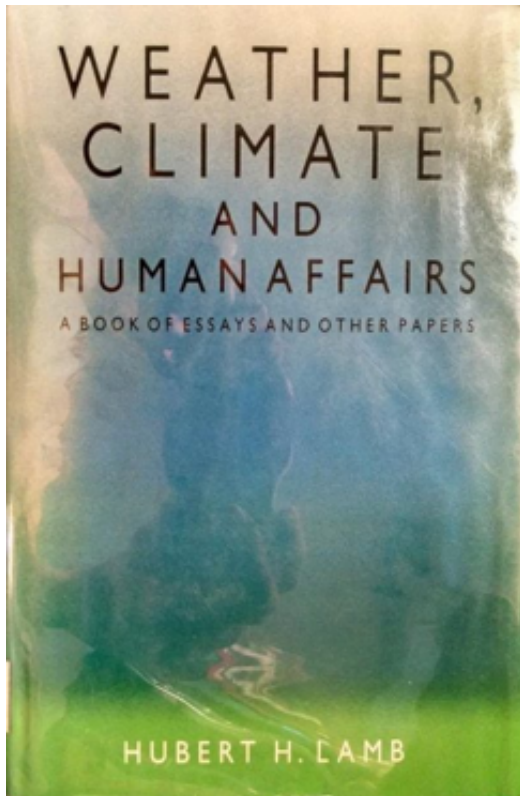


Mikhail Budyko (1920-2001) was perhaps the greatest, and certainly the most influential, Russian climatologist of the twentieth century. He directed the Voeikov Main Geophysical Observatory in St Petersburg for 20 years, led work in the 1970s and 1980s on climate change at the State Hydrological Institute, and after 1989 was very influential in the Research Centre for Interdisciplinary Cooperation at the Russian Academy of Sciences. Budyko made many contributions to the physical understanding of climatic process and already recognised in the 1960s that a variety of human influences of the global climate would be significant. **'Global Climatic Catastrophes'**, co-written with colleagues Golitsyn and Izrael, was published first in Russian in 1986, before this English edition appeared two years later. It marked the seriousness with which Russian climatologists viewed the prospect of nuclear war

and its profound climatic and ecological consequences. Budyko et al. staked a claim for the Soviets' early contribution to this emerging 1980s concern by showing that understanding the effects of aerosols on climate, central to the theory of nuclear winter, could be traced back to Russian work in the 1970s. Budyko opened the book by stating that "the most important problem of our times" was the necessity to eliminate the possibility of large-scale nuclear warfare, and in their conclusion observed that the most reliable way of avoiding a human-caused climatic catastrophe was "...a gradual reduction and final complete elimination of all types of weapons that threaten the fate of mankind" (p.85).

Lamb, H.H. (1988) *Weather, Climate and Human Affairs: A Book of Essays and Other Papers*. London: Routledge. 364pp. [Reprinted in 2011]

This volume of (mostly) revised and reprinted essays written by Hubert Lamb (1913-1997) was his penultimate book, compiled when he was 74 years old and published in 1988. Lamb was one of Britain's leading climatologists of the twentieth century, a pioneer of the new field of historical climatology and he was convinced – well before the idea was



fashionable – of the importance of climatic variability and change for human societies. In 1971, guided by these convictions, Lamb had the vision and energy to establish the Climatic Research Unit at the University of East Anglia, one of the first dedicated research centres to the study of climate and its changes.

'***Weather, Climate and Human Affairs***' offers an impressive window into Lamb's expansive work, ranging from climate in the Middle Ages, to the Little Ice Age, drought in Africa, and volcanoes and climate. He recognised the influence and significance of human emissions of carbon dioxide for climatic processes, but he was always guarded, even here in 1988, about their relationship with other natural processes affecting the climate. In the final essay of the book, Lamb remarked, "The world-wide warmth of the twentieth century ... should be attributed partly to carbon dioxide increase; ... but

the lull in volcanic activity in the northern hemisphere ... also played an important part – it may have been the main part" (p.349). The enduring interest in Lamb's approach to historical climatology prompted a full reprint of this book by Routledge in 2011.

[1] Matthes, F. (1939) Report of the Committee on Glaciers. *Transactions of the American Geophysical Union*. 20: 518-523.

[2] Allen, H.A. (2003) Jean Grove, obituary.
<https://www.quaternary.group.cam.ac.uk/history/others/grove.html>

[3] Hulbe, C.L. et al. (2010) Women in glaciology, a historical perspective. *Journal of Glaciology*. 56: 944-964.

[4] See: Hulme, M. (2023) *Climate Change Isn't Everything: Liberating Climate Politics from Alarmism*. Cambridge: Polity Press.

[5] Matthews, J.A. (1988) Grove, J.M. 1988: '*The Little Ice Age*'. *Progress in Physical Geography*. 12(4): 613-615.

[6] Benedict, J.B. and Maisch, M. (1989) '*The Little Ice Age*', Grove, J.M. 1988. *Geoarchaeology*. 4(4): 363-365.

[7] Smith, D.E. (1990) Book reviews: Grove, J.M. 1988: '*The Little Ice Age*'. *Applied Geography*. 10: 75-85.

[8] Grove *op. cit.*, p.5

[9] Matthews *op. cit.*, p.614

[10] p.202 in: IPCC (1990) *Climate Change: The IPCC Scientific Assessment*. (eds.) Houghton, J.T., Jenkins, G.J. and Ephraums, J.J. Cambridge: Cambridge University Press. 364pp.

[11] For a discussion of this controversial IPCC diagram, see: Jones, P.D. et al. (2009) High-resolution palaeoclimatology of the last millennium: a review of current status and future prospects. *The Holocene*. 19(1): 3-49.

[12] Fagan, B.M. (2000) *The Little Ice Age – How Climate Made History 1300-1850*. New York: Basic Books; Sager, A.D. (2006) *The Little Ice Age and 17th Century Dutch Landscape Painting: A Study of the Impact of Climate on Art*. Dominguez Hills: California State University; Berhringer, W. et al. (eds.) (2005) *Cultural Consequences of the Little Ice Age*. Göttingen. Vandenhoeck & Ruprecht; White, S. (2017) *A Cold Welcome: The Little Ice Age and Europe's Encounter with North America*. Cambridge, MA: Harvard University Press; Degroot, D. (2018) *The Frigid Golden Age: climate change, the Little Ice Age, and the Dutch Republic, 1560-1720*. Cambridge: Cambridge University Press; Blom, P. (2019) *Nature's Mutiny: How the Little Ice Age of the Long Seventeenth Century Transformed the West and Shaped the Present*. Cambridge, MA: Harvard University Press; Brook, T. (2024) *The Price of Collapse: The Little Ice Age and the Fall of Ming China*. Princeton, NJ: Princeton University Press. .

[13] Bradley, R.S. and Jones, P.D. (1992) When was the "Little Ice Age"? *Proceedings of the International Symposium on Little Ice Age Climates* (ed. Mikami, T). Department of Geography, Tokyo Metropolitan University.

[14] Grove, J.M. (2001) The initiation of the Little Ice Age in regions round the North Atlantic. *Climatic Change*. 48: 53-82.

[15] Grove, J.M. (2004) *Little Ice Ages: Ancient and Modern*. (2 vols.) (2nd Edn.) London: Routledge. 721pp.

[16] p.295 in: IPCC (2021) *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK, and New York, NY, USA: Cambridge University Press, 2391pp.

[17] Fagan, B. (2000) Classics in physical geography revisited. Grove, J.M. 1988: 'The Little Ice Age'. London: Routledge. *Progress in Physical Geography*. 32(1): 103-106.

[18] p.374: Clapperton, C.M. (1989) Grove, J.M. 1988: 'The Little Ice Age'. London: